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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,733	02/28/2005	Yoshitaka Nakajima	07241.0038	2552
22852 7590 08/08/2007 FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			EXAMINER LAO, LUN S	
			ART UNIT 2615	PAPER NUMBER
			MAIL DATE 08/08/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/525,733

**Applicant(s)**

NAKAJIMA ET AL.

**Examiner**

Lun-See Lao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 06-25-2007.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Introduction***

1. This action is in response to the applicant's response filed on 05-10-2007.

Claims 1-16 are pending.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holzrichter (US PAT. 5,729,694) in view of Iwata (US PAT. 4,654,883).

Consider claim 1, Holzrichter teaches a microphone (see figs 3A, 3B (31-33 EM sensor) sampling one of a non-audible murmur articulated by a variation in resonance filter (reads on 49, 56 processing unit and Fourier transforms) characteristics associated with motion of the phonatory organ (see figs 5-7 and col. 14 line 45-col. 16 line 3), the non-audible murmur not involving regular vibration of the vocal cords, the non-audible murmur being a vibration sound generated when an externally non-audible respiratory sound is transmitted through internal soft tissues (see fig.7), a whisper which is audible but is uttered without regularly vibrating the vocal cords, a sound uttered by regularly vibrating the vocal cords and including a low voice or a murmur (see figs 9a-10b), and various sounds such as a teeth gnashing sound and a tongue clucking sound (see col.

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6 line 45-col. 7 line 64 and col. 32 line 1-col. 33 line 20), but Holzrichter fail to teach that the microphone being installed on a surface of the skin on the sternocleidomastoid muscle immediately below the mastoid of the skull, that is, in the lower part of the skin behind the auricle.

However, Iwata teaches detecting aural oscillation using a microphone (fig.2, 17) installed on the surface of the skin behind an ear (see col. 3 line 30-56). Iwata also teaches that the position of microphone 17 is slidably adjustable along the back of the ear (retaining mechanism 13/16, col. 3, lines 6-29), just like a typical adjustable length headphone. One of ordinary skill in the art would realize that such adjustable range includes the location of the skin on the sternocleidomastoid muscle immediately below the mastoid of the skull, that is, in the lower part of the skin behind the auricle.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Iwata into Holzrichter to provide more accurate speech recognition.

Consider claims 2-3, Iwata teaches that the microphone comprises a diaphragm (see fig.3, (22)) installed on the surface of the skin and a sucker that sticks to the diaphragm (see col. 3 line 30-56) and the microphone (see fig.1, (17)) is integrated with a head-installed object such as glasses, a headphone, a supra-aural earphone, a cap, or a helmet which is installed on the human head (see fig.2 and see col. 3 line 30-56).

Consider claims 4-8, Holzrichter teaches that a communication interface system comprises the microphone (see fig.20 (91-93)) and a signal processing apparatus (90) that processes a signal sampled through the microphone, wherein a result of processing

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by the signal processing apparatus is used for communications (see col. 56 line 35-55); and the communication interface system wherein the signal processing apparatus includes an analog digital converting section (see fig.5, 49 and col. 14 line 46-col. 15 line 67) that quantizes a signal sampled through the microphone (see fig. 20, (91-93, EM sensor)), a processor section (90) that processes a result of the quantization by the analog digital converting section(see fig.5, 49 and col. 14 line 46-col. 15 line 67), and a transmission section that transmits a result of the processing by the processor section to an external apparatus (96 and see col. 56 line 35-55); and the signal processing apparatus includes an analog digital converting section (see fig.5, 49 and col. 14 line 46-col. 15 line 67) that quantizes a signal sampled through the microphone and a transmission section that transmits a result of the quantization by the analog digital converting section to an external apparatus (see fig. 20, (96) and see col. 56 line 35-55) and in that the external apparatus processes (such as cellular) the result of the quantization (see col. 16 lines 51-67); and the signal processing apparatus includes an analog digital converting section (see fig.5, 49 and col. 14 line 46-col. 15 line 67) That quantizes a signal sampled through the microphone (EM sensor), a processor section that processes a result of the quantization by the analog digital converting section, and a speech recognition section that executes a speech recognition process on a result of the processing by the processor section (see fig.8 and see col. 16 line 51-col. 17 line 18); and a transmission section that transmits a result of the speech recognition by the speech recognition section to an external apparatus(see fig.8 and see col. 16 line 51-col. 17 line 18).

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Consider claims 9-12, Holzrichter teaches the communication interface system wherein an apparatus (see figs. 8 and 20) in a mobile telephone network executes a speech recognition process on the result of the processing by the processor section, the result being transmitted by the transmitting section(see col. 16 line 51-col. 17 line 18 and see col. 56 line 35-55); and the signal processing executed by the signal processing apparatus is a modulating process in which the process section modulates the signal into an audible sound (see figs 4-7 and see col. 15 line 29-col. 16 line 50); and the modulating process applies a fundamental frequency of the vocal cords to the non-audible murmur to convert the non-audible murmur into an audible sound involving the regular vibration of the vocal cords(see figs 4-7 and see col. 15 line 29-col. 16 line 50); and the modulating process converts a spectrum of the non-audible murmur not involving the regular vibration of the vocal cords into a spectrum of an audible sound uttered using the regular vibration of the vocal cords(see figs 4-7 and see col. 15 line 29-col. 16 line 50).

Consider claims 13-16, Holzrichter teaches that the communication interface system wherein the modulating process uses the spectrum of the non-audible murmur (see figs 14A-15B) speech recognition apparatus to recognize phonetic units such as syllables, semi- syllables, phonemes, two-juncture phonemes, and three-juncture phonemes and uses a speech synthesis technique to convert the phonetic units recognized into an audible sound uttered using the regular vibration of the vocal cords (see figs. 4-7 and see col. 20 line 16-67); and input gain (see fig.5, (47)) is controlled (45) in accordance with a magnitude of a dynamic range of a sound sampled through the microphone (EM

sensor and see col. 15 line 29-67); and the speech recognition section appropriately executes speech recognition utilizing an acoustic model of at least one of the non-audible murmur, a whisper which is audible but is uttered without regularly vibrating the vocal cords, a sound uttered by regularly vibrating the vocal cords and including a low voice or a murmur (see figs 9a-10b), and various sounds such as a teeth gnashing sound and a tongue clucking sound (see col. 6 line 45-col. 7 line 64 and col. 9 line 16-col. 10 line 68) and signal processing apparatus (see figs. 2-8 and 20) that processes a signal sampled through the microphone according to claim 1 (see above claim 1 rejection).

#### ***Response to Arguments***

4. Applicant's arguments filed 05-10-2007 have been fully considered but they are not persuasive.

Applicant argued in substance that Holzrichter and Iwata both do not teach a "microphone being installed on a surface of the skin on the sternocleidomastoid muscle immediately below the mastoid of the skull, that is, in the lower part of the skin behind the auricle" because figure 2 of Iwata shows the microphone is placed on the upper part of the skin (Remarks, page 6 last paragraph).

The examiner's response is that Iwata teaches detecting aural oscillation, including the use of a microphone 17 which is installed on the surface of the skin behind an ear (fig.2; col. 3 line 30-56). Further, Iwata specifically teaches that the position of microphone 17 is slidably adjustable along the back of the ear (via the retainer member

13 and the sliding rod 16, col. 3, lines 6-29), just like a typical adjustable length headphone. Therefore, one of ordinary skill in the art would realize that the adjustable range of lwata includes the location of the skin on the sternocleidomastoid muscle immediately below the mastoid of the skull, which is in the lower part of the skin behind the auricle. A user adjusting the length of headphone is common practice. Therefore, the combined teaching of Holzrichter and lwata meets "microphone being installed on a surface of the skin on the sternocleidomastoid muscle immediately below the mastoid of the skull, that is, in the lower part of the skin behind the auricle" as recited in claim 1.

Regarding the argued detection of murmur (Remarks, page 7, 3<sup>rd</sup> paragraph), Holzrichter teaches non-audible murmur articulated by a variation in resonance filter (see fig.5 and col. 23, lines 34-61), as discussed in the rejection of claim 1.

Applicant's arguments are thus not persuasive.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of



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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Murase (US PAT. 4,972,468) is cited to show other related microphone and communication interface system.

7. Any response to this action should be mailed to:

Mail Stop \_\_\_\_ (explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Facsimile responses should be faxed to:  
**(571) 273-8300**

Hand-delivered responses should be brought to:  
Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao, Lun-See whose telephone number is (571) 272-7501. The examiner can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao, Lun-See *L.S.*  
Patent Examiner  
US Patent and Trademark Office  
Knox


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571-272-7501

Date 07-25-2007



VIVIAN CHIN  
SUPERVISORY PATENT EXAMINER  
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